Surgical Management of Acute Pancreatitis

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Overview

- Biliary pancreatitis – a cost effective algorithm
- Key concepts in surgical management of severe acute pancreatitis
  - Early recognition of severe pancreatitis.
  - Complications of pancreatitis and the ability to diagnose them evolve over time.
  - Enteral nutrition is superior to parenteral nutrition in severe pancreatitis.
  - The value of surgical intervention can be determined 4 weeks into the course of severe pancreatitis and delay only prolongs the duration of disability.
  - The Step-up approach to complicated pancreatitis.
Biliary Pancreatitis – Algorithm Foundations

• Most CBD stones spontaneously pass
  – Routine IOC vs. selective IOC data
  – 6 week follow-up cholangiograms

• ~30% recurrence of AP within 6 weeks

• Same-admission cholecystectomy is less expensive

• Some patients are going to get sick

< 3 Ranson’s Criteria
1. Pain management
2. Bowel rest
3. IVF

Comorbidities preclude surgery

CBD > 6 mm & Bili > 4

Pain persists greater than 72 hrs

Same admission Chole/IOC

≥ 3 Ranson’s Criteria
1. ICU, consider transfer
2. Pain management
3. Enteral feeding
4. Organ support

ERCP

IV Contrast CT

Cholangitis

Normal renal function @ 72 hrs

1. Delayed Intervention
2. Transfer

Home
# Early Recognition of Severe Pancreatitis

## TABLE 38.2
### SEVERITY SCORING SYSTEMS FOR ACUTE PANCREATITIS

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Value (n or range)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RANSON’S CRITERIA</strong></td>
<td></td>
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<tr>
<td><strong>On admission</strong></td>
<td><strong>Within 48 h</strong></td>
</tr>
<tr>
<td>Age &gt;55 y</td>
<td>Hemoglobin ↓ below 10 mg/dL</td>
</tr>
<tr>
<td>WBC &lt; 16 x 10^9/L</td>
<td>Blood urea Nitrogen ↑ &gt; 5 mg/dL</td>
</tr>
<tr>
<td>LDH &gt; 350 U/L</td>
<td>Calcium ↓ &lt; 8 mg/dL</td>
</tr>
<tr>
<td>AST &gt; 250 U/L</td>
<td>PaO_2 &lt; 60 mmHg (8 kPa)</td>
</tr>
<tr>
<td>Glucose &gt; 200 mg/dL</td>
<td>Base deficit &gt; 4 mEq/L</td>
</tr>
<tr>
<td></td>
<td>Fluid sequestration &gt; 6 L</td>
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</tbody>
</table>

### Antibiotic use (%)
- **Prophylactic use**
  - Non-carbapenem antibiotics: 58 (15)
- **Non-carbapenem antibiotics**
  - 53 (26)

### Nutrition
- **Average duration without nutrition (days)**
  - Enteral feeding (%): 17 (10)
  - TPN administration (%): 60 (38)
  - Enteral feeding or PO used or considered first (%): 23 (7)
INITIAL DISEASE SEVERITY ASSESSMENT AND MANAGEMENT

• Key initial decision-making points include:
  – Determining the level of nursing care and monitoring necessary.
  – Anticipating the required volume of resuscitative fluids.
  – Exploring potential complications in a cost-effective manner.
  – Consideration of transfer to a tertiary care center

ROLE OF IMAGING

• Not required to make the diagnosis
  – Epigastric pain
  – Elevated (3x upper limit) serum amylase/lipase
• No contrast = reduced prognostic information
• Potentially harmful – nephrotoxicity

• IT CAN WAIT
EVOLUTION OF SAP
NUTRITION FOR SAP

- Avoid EN with malperfusion
- Deliver EN distal to the ligament of Treitz
  - Avoids reflux into an atonic stomach
  - Reduces pancreatic secretion > 50%
- Elemental formula
  - Exocrine insufficiency
  - Hypertonic solutions

EARLY PHASE INTERVENTIONS - SAP
Adrenal Insufficiency

EARLY PHASE INTERVENTIONS
Adrenal Insufficiency

“Although an increase in adrenocorticotropic hormone levels is suggested to increase corresponding cortisol levels, cortisol levels decreased during the development of necrotizing acute pancreatitis. This phenomenon, along with the continuously decreasing corticosteroid-binding globulin levels, brings up the hypothesis of a relative adrenal insufficiency, which favors acinar cell apoptosis and hence may trigger the development of necrosis in the initial vulnerable phase of acute pancreatitis.”


Indications for Early Operative Intervention

Abdominal compartment syndrome is an early, lethal complication of acute pancreatitis.


<table>
<thead>
<tr>
<th></th>
<th>ACS</th>
<th>Debridement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>12</td>
<td>99</td>
</tr>
<tr>
<td>Mortality</td>
<td>50%</td>
<td>12%</td>
</tr>
<tr>
<td>Onset of pancreatitis and surgery (days) *</td>
<td>11.7 ± 19.6</td>
<td>40.4 ± 27.6</td>
</tr>
<tr>
<td>Requiring multiple debridements</td>
<td>6 (50%)</td>
<td>59 (60%)</td>
</tr>
<tr>
<td>Length of stay (days)</td>
<td>53.3 ± 25.2</td>
<td>33.8 ± 30.7</td>
</tr>
</tbody>
</table>
Effects of Decompressive Laparotomy

Patient Outcomes

<table>
<thead>
<tr>
<th>Mortality</th>
<th>6 (50%)</th>
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</thead>
<tbody>
<tr>
<td>Morbidity</td>
<td></td>
</tr>
<tr>
<td>Pleural Effusion</td>
<td>5 (42%)</td>
</tr>
<tr>
<td>Bacteremia</td>
<td>8 (66%)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>8 (66%)</td>
</tr>
<tr>
<td>C diff</td>
<td>2 (16%)</td>
</tr>
<tr>
<td>DVT/ PE</td>
<td>3 (25%)</td>
</tr>
<tr>
<td>Pseudocyst</td>
<td>1 (8%)</td>
</tr>
<tr>
<td>Wound infection</td>
<td>2 (16%)</td>
</tr>
<tr>
<td>Enterocutaneous fistula</td>
<td>1 (8%)</td>
</tr>
<tr>
<td>Pancreatic fistula</td>
<td>1 (8%)</td>
</tr>
<tr>
<td>Recovery in Survivors</td>
<td></td>
</tr>
<tr>
<td>Days in ICU</td>
<td>42.5 ± 13</td>
</tr>
<tr>
<td>Days in Hospital</td>
<td>53.3 ± 25.2</td>
</tr>
<tr>
<td>Days on Ventilator</td>
<td>31.3 ± 11.4</td>
</tr>
<tr>
<td>Disposition</td>
<td></td>
</tr>
<tr>
<td>SNF</td>
<td>2 (33%)</td>
</tr>
<tr>
<td>LTAC</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>Rehab</td>
<td>1 (17%)</td>
</tr>
</tbody>
</table>
The need for surgical intervention can be determined 4 weeks into the course of severe pancreatitis and treatment delay only prolongs the duration of disability.

Debridement and External Drainage of Necrosis

LATE PHASE INTERVENTIONS

- Cholecystectomy
- Feeding access
- Symptomatic pseudocyst
  - Endoscopic drainage
  - Percutaneous drainage
  - Surgical drainage
- Biliary Obstruction
- Abscess
  - Endoscopic drainage
  - Surgical drainage
- Enteric fistula
- Hemorrhage
- Diabetes
- Exocrine insufficiency
The Step-Up Approach

• A word of caution....
Disrupted Pancreatic Duct
Key Concepts

- Early recognition of severe pancreatitis.
- Complications of pancreatitis and the ability to diagnose them evolve over time.
- Enteral nutrition is superior to parenteral nutrition in severe pancreatitis.
- The value of surgical intervention can be determined 4 weeks into the course of severe pancreatitis and delay only prolongs the duration of disability.
- The Step-up approach to complicated pancreatitis.
Summary

• Late phase management should be personalized
  – Minimally invasive/natural orifice approaches when possible
  – Philosophy of a single, well-timed invasive intervention